

Title: Capabilities of the Environmental Effects Branch at Marshall Space Flight Center

Authors: Dr. Jan Rogers, Miria Finckenor, Mary Nehls
Mail Code EM50, NASA Marshall Space Flight Center

The Environmental Effects Branch at the Marshall Space Flight Center supports a myriad array of programs for NASA, DoD, and commercial space including human exploration, advanced space propulsion, improving life on Earth, and the study of the Sun, the Earth, and the solar system. The branch provides testing, evaluation, and qualification of materials for use on external spacecraft surfaces and in contamination-sensitive systems. Space environment capabilities include charged particle radiation, ultraviolet radiation, atomic oxygen, impact, plasma, and thermal vacuum, anchored by flight experiments and analysis of returned space hardware. These environmental components can be combined for solar wind or planetary surface environment studies or to evaluate synergistic effects. The Impact Testing Facility allows simulation of impacts ranging from sand and rain to micrometeoroids and orbital debris in order to evaluate materials and components for flight and ground-based systems. The Contamination Control Team is involved in the evaluation of environmentally-friendly replacements for HCFC-225 for use in propulsion oxygen systems, developing cleaning methods for additively manufactured hardware, and reducing risk for Space Launch System.